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(54) **Blank for a box with at least one curved wall**

Zuschnitt für eine Schachtel mit einer gekrümmten Wand

Flan pour boîte ayant une paroi courbe

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## Description

[0001] The invention relates to a blank as according to the preamble of claim 1.

[0002] Such a blank is known from DE-U-9318467 and DE-U-9002504.

[0003] The curving main surfaces of such a known blank are bounded by at least two cut edges which in the corresponding box formed by the blank connect poorly to the adjoining main end surfaces.

[0004] In the blank according to DE-U-9002504 a connection is obtained by means of other auxiliary lips and complicated auxiliary constructions.

[0005] The invention has for its object to cause the curved wall of the corresponding box to connect well on to the end walls and provides for this purpose a blank as according to claim 1.

[0006] The end walls of the blank according to GB-A-773138 connect onto the curving surfaces although these end surfaces are separated from the main surfaces by means of curved folding edges, which causes drawbacks in respect of the available volume and the stackability of boxes obtained with this blank.

[0007] The blank according to the invention preferably has at least two, and more preferably at least three, curving auxiliary surfaces located at a mutual distance on at least one and preferably two folding edge(s) of one and preferably two curving main surface(s). The number and shape of the curving auxiliary surfaces of a blank according to the invention will depend on the desired curve of the curving wall and on the desired closure of the curving wall relative to the end wall.

[0008] The invention is further elucidated with reference to the following figure description of a number of preferred embodiments of the invention.

[0009] In the drawings:

figures 1 and 2 show preferred embodiments of a blank according to the invention in top view;  
figures 3 and 4 show perspective views of the box obtained from the respective blanks shown in figures 1 and 2 via folding and, if necessary, fixing operations.

[0010] A preferred embodiment of a blank 1 according to the invention has two flat main surfaces 2, 4; two curving main surfaces 3, 5; two end main surfaces 6, 6'. These main surfaces 2, 4, 3, 5, 6, 6' of the blank form the walls of the corresponding box shown in figure 3.

[0011] The curving main surface 3, 5 is coupled at a folding edge A to a number of curving auxiliary surfaces 10, 11, 12. Each curving surface 3, 5 preferably has two opposite folding edges A which are each provided with a number of, and preferably three, curving auxiliary surfaces 10, 11, 12. A space 13, 14 is provided between the curving auxiliary surfaces, which space is bounded by a cut edge. The curving auxiliary surfaces 10, 11, 12 are positioned in a mirror-symmetrical pattern relative

to the middle of folding edge A of curving main surface (s) 3, 5.

[0012] The curving auxiliary surfaces 12 are of a larger dimension than the other curving auxiliary surfaces 10, 11. The size and shape of curving auxiliary surface 12 are chosen such that in the formed corresponding box (figure 3, 4) they lie against each other in the same plane.

[0013] The curving main surface 5 is coupled along the full length to a peripheral auxiliary surface 7. Blank 1 comprises two auxiliary end surfaces 8 and 9 which preferably have the same dimension and the same shape as the main end surfaces 6, 6'. In the corresponding box (figure 3) a curving auxiliary surface 12 will be received on each box end between an auxiliary end surface 8, 9 and a main end surface 6, 6', which main end surface 6, 6' forms the outer end wall.

[0014] Another embodiment of a blank 17 has auxiliary end surfaces 15, 16 with a shape differing slightly from main end surfaces 6, 6', from which the corresponding box is shown in figure 4 and which box has the same shape and dimension as the box of figure 3.

[0015] In order to form the box the blank 1, 17 is first folded along folding edges B, whereafter the auxiliary surface 7 is fixed to the main surface 2 of the blank, for instance by gluing to form a flat wall 20, thereby obtaining a tube. The curving auxiliary surfaces 10, 11 are then folded inward on which the auxiliary end surfaces 8, 9 respectively 15, 16 are placed, whereafter the curving auxiliary surfaces 12 are folded thereover and whereafter finally the main end surfaces 6, 6' are placed on the already folded-up assembly to form the end wall 18, 21. The curvature of a cut edge of the end wall corresponds with the curvature of the curving wall 19. The end wall 18, 21 also connects well onto the other walls of the box. All parts are preferably mutually adhered by means of an adhesive such as glue. The curving surface is held in its curved position in that a curving auxiliary surface 12 is enclosed between an auxiliary end surface and a main end surface and also in that the curving auxiliary surfaces 10, 11 are arranged relative to curving auxiliary surface 12 in interwoven manner between the auxiliary end surface.

[0016] With the exception of auxiliary end surfaces 15, 16, the end wall 21 of the box in figure 4 is the same as in the embodiment of figure 3.

[0017] Assembly of a box formed by a blank according to the invention can be formed in other manner, in particular with another folding sequence.

[0018] The curving auxiliary surfaces 10, 11, 12 can differ in number and shape from the above illustrated preferred embodiments.

## Claims

1. Blank (1) with main (2, 4, 3, 5, 6, 6') and auxiliary (10,11,12) surfaces, which main surfaces

(2,4,3,5,6,6') forms the walls (18,19,20,21) of the corresponding box, wherein the main surfaces (2,4,3,5,6,6') are mutually separated from the auxiliary surfaces (10,11,12) by substantially straight folding edges (A) and wherein at least one main surface is adapted as a curving main surface (3,5) which defines a curved outer wall (19) in the corresponding box and wherein the auxiliary surfaces (10,11,12) are adapted to be mounted at right angles to the curved outer wall (19) in the corresponding box, **characterized in that** at least one folding edge (A) of the curving main surface (3,5) of the blank (1) is coupled to at least one curving auxiliary surface (10,11,12).

2. Blank (1) as claimed in claim 1, **characterized in that** the folding edge (A) of the curving main surface (3,5) of the blank (1) is coupled to at least two curving auxiliary surfaces (10,11,12) located at a mutual distance.
3. Blank (1) as claimed in claim 1 or 2, **characterized in that** the folding edge (A) of the curving main surface (3,5) of the blank (1) is coupled to three curving auxiliary surfaces (10,11,12) located at a mutual distance.
4. Blank (1) as claimed in claim 1, 2 or 3, **characterized in that** the curving auxiliary surfaces (10,11,12) on the folding edge (A) of the curving main surface (3,5) are positioned in a mirror-symmetrical pattern relative to the middle of folding edge.
5. Blank (1) as claimed in claim 1, 2, 3 or 4, **characterized in that** the curving main surface (3,5) is provided with two mutually opposite folding edges (A), wherein each folding edge (A) is coupled to at least one curving auxiliary surface (10,11,12).
6. Blank (1) as claimed in claim 1, 2, 3, or 4, **characterized in that** the curving main surface (3,5) is provided with two mutually opposite folding edges (A), wherein each folding edge (A) is coupled to three curving auxiliary surfaces (10,11,12) which are located at a mutual distance and which are ordered in a mirror-symmetrical pattern relative to the middle of each folding edge (A).
7. Blank (1) as claimed in claim 5 or 6, **characterized in that** the blank (1) comprises six main surfaces (2,4,3,5,6,6'): two curving main surfaces (3,5), two flat main surfaces (2,4) and two main end surfaces (6,6') forming the substantially flat end walls (18,21) of the box.
8. Blank (1) as claimed in claim 7, **characterized in that** the main end surfaces (6,6') are each provided

with two curved cut edges, the curvature of which is substantially the same as the curvature of the curving main surface (3,5) of the box.

- 5 9. Blank (1) as claimed in claim 7 or 8, **characterized by** two auxiliary end surfaces (8,9) having substantially the same dimension and shape as the main end surfaces (6,6').
- 10 10. Blank (1) as claimed in any of the foregoing claims 1-9, **characterized in that** one curving main surface (5) is coupled to a peripheral auxiliary surface (7) along substantially the full length of a folding edge (B).
- 15 11. Box formed by the blank (1) as claimed in claims 1-10.
- 20 12. Box as claimed in claim 11, **characterized in that** at least one curving auxiliary surface (10,11,12) is enclosed between a main end surface (6,6') and an auxiliary end surface (8,9;15,16).
- 25 13. Box as claimed in claim 11 or 12, **characterized in that** the curving main surface (3,5) is held in curved position by at least one curving auxiliary surface (10,11,12).
- 30 14. Box as claimed in at least one of the claims 11-13, **characterized in that** at least one curving main surface (3,5) is fixed to at least one auxiliary end surface (8,9;15,16).

#### 35 Patentansprüche

- 40 1. Zuschnitt (1) mit Hauptflächen (2, 4, 3, 5, 6, 6') und Hilfsflächen (10, 11, 12), wobei die Hauptflächen (2, 4, 3, 5, 6, 6') die Wände (18, 19, 20, 21) der entsprechenden Schachtel bilden, wobei die Hauptflächen (2, 4, 3, 5, 6, 6') durch im wesentlichen gerade Falzkanten (A) von den Hilfsflächen (10, 11, 12) getrennt sind und wobei wenigstens eine Hauptfläche als eine sich krümmende Hauptfläche (3, 5) ausgebildet ist, die eine gekrümmte Außenwand (19) der entsprechenden Schachtel definiert, und wobei die Hilfsflächen (10, 11, 12) zur Befestigung in rechten Winkeln an der gekrümmten Außenwand (19) der entsprechenden Schachtel ausgebildet sind, **dadurch gekennzeichnet,**
- 45 **dass** wenigstens eine Falzkante (A) der sich krümmenden Hauptfläche (3, 5) des Zuschnitts (1) mit wenigstens einer Krümmungshilfsfläche (10, 11, 12) verbunden ist.
- 50 2. Zuschnitt (1) nach Anspruch 1, **dadurch gekennzeichnet,**
- 55 **dass** die Falzkante (A) der sich krümmenden

- Hauptfläche (3, 5) des Zuschnitts (1) mit wenigstens zwei in gegenseitigem Abstand angeordneten Krümmungshilfsflächen (10, 11, 12) verbunden ist.
3. Zuschnitt (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, **dass** die Falzkante (A) der sich krümmenden Hauptfläche (3, 5) des Zuschnitts (1) mit drei in gegenseitigem Abstand angeordneten Krümmungshilfsflächen (10, 11, 12) verbunden ist.
  4. Zuschnitt (1) nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet**, **dass** die Krümmungshilfsflächen (10, 11, 12) an der Falzkante (A) der sich krümmenden Hauptfläche (3, 5) in einem bezüglich der Mitte der Falzkante spiegelsymmetrischen Muster angeordnet sind.
  5. Zuschnitt (1) nach Anspruch 1, 2, 3 oder 4, **dadurch gekennzeichnet**, **dass** die sich krümmende Hauptfläche (3, 5) mit zwei einander gegenüberliegenden Falzkanten (A) versehen ist, wobei jede Falzkante (A) mit wenigstens einer Krümmungshilfsfläche (10, 11, 12) verbunden ist.
  6. Zuschnitt (1) nach Anspruch 1, 2, 3 oder 4, **dadurch gekennzeichnet**, **dass** die sich krümmende Hauptfläche (3, 5) mit zwei einander gegenüberliegenden Falzkanten (A) versehen ist, wobei jede Falzkante (A) mit drei Krümmungshilfsflächen (10, 11, 12) verbunden ist, die in einem gegenseitigen Abstand und bezüglich der Mitte jeder Falzkante (A) in einem spiegelsymmetrischen Muster angeordnet sind.
  7. Zuschnitt (1) nach Anspruch 5 oder 6, **dadurch gekennzeichnet**, **dass** der Zuschnitt (1) sechs Hauptflächen (2, 4, 3, 5, 6, 6') aufweist: zwei sich krümmende Hauptflächen (3, 5), zwei flache Hauptflächen (2, 4) und zwei die im wesentlichen flachen Endwände (18, 21) der Schachtel bildende Hauptendflächen (6, 6').
  8. Zuschnitt (1) nach Anspruch 7, **dadurch gekennzeichnet**, **dass** die Hauptendflächen (6, 6') jeweils mit zwei gekrümmten Schnittkanten versehen sind, deren Krümmung im wesentlichen die gleiche wie die Krümmung der sich krümmenden Hauptflächen (3, 5) der Schachtel ist.
  9. Zuschnitt (1) nach Anspruch 7 oder 8, **gekennzeichnet durch** zwei Hilfsendflächen (8, 9) mit im wesentlichen der gleichen Abmessung und Form wie die Hauptendflächen (6, 6').
  10. Zuschnitt (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, **dass** eine sich krümmende Hauptfläche (5) entlang im wesentlichen der gesamten Länge einer Falzkante (B) mit einer Hilfsrandfläche (7) verbunden ist.
  11. Schachtel, geformt durch den Zuschnitt (1) nach einem der Ansprüche 1 bis 10.
  12. Schachtel nach Anspruch 11, **dadurch gekennzeichnet**, **dass** wenigstens eine Krümmungshilfsfläche (10, 11, 12) zwischen einer Hauptendfläche (6, 6') und einer Hilfsendfläche (8, 9; 15, 16) eingeschlossen ist.
  13. Schachtel nach Anspruch 11 oder 12, **dadurch gekennzeichnet**, **dass** die sich krümmende Hauptfläche (3, 5) durch wenigstens eine Krümmungshilfsfläche (10, 11, 12) in einer gekrümmten Lage gehalten ist.
  14. Schachtel nach einem der Ansprüche 11 bis 13, **dadurch gekennzeichnet**, **dass** wenigstens eine sich krümmende Hauptfläche (3, 5) an wenigstens einer Hilfsendfläche (8, 9; 15, 16) befestigt ist.

#### Revendications

1. Flanc (1) avec des surfaces principales (2, 4, 3, 5, 6, 6') et auxiliaires (10, 11, 12), lesquelles surfaces principales (2, 4, 3, 5, 6, 6') forment les parois (18, 19, 20, 21) de la boîte correspondante, dans lequel les surfaces principales (2, 4, 3, 5, 6, 6') sont mutuellement séparées des surfaces auxiliaires (10, 11, 12) par des bords de pliage sensiblement droits (A) et dans lequel au moins une surface principale est adaptée comme surface principale courbe (3, 5) qui définit une paroi extérieure courbe (19) dans la boîte correspondante et dans lequel les surfaces auxiliaires (10, 11, 12) sont adaptées pour être montées à angle droit par rapport à la paroi externe courbe (19) dans la boîte correspondante, **caractérisé en ce qu'au moins un bord de pliage (A) de la surface principale courbe (3, 5) du flanc (1) est couplé à au moins une surface auxiliaire courbe (10, 11, 12).**
2. Flanc (1) selon la revendication 1, **caractérisé en ce que le bord de pliage (A) de la surface principale courbe (3, 5) du flanc (1) est couplé à au moins deux surfaces auxiliaires courbes (10, 11, 12) placées à une distance mutuelle.**

3. Flanc (1) selon la revendication 1 ou 2, **caractérisé en ce que** le bord de pliage (A) de la surface principale courbe (3, 5) du flanc (1) est couplé à trois surfaces auxiliaires courbes (10, 11, 12) placées à une distance mutuelle. 5
4. Flanc (1) selon la revendication 1, 2 ou 3, **caractérisé en ce que** les surfaces auxiliaires courbes (10, 11, 12) sur le bord de pliage (A) de la surface principale courbe (3, 5) sont positionnées en un motif symétrique du type miroir par rapport au milieu du bord de pliage. 10
5. Flanc (1) selon la revendication 1, 2, 3 ou 4, **caractérisé en ce que** la surface principale courbe (3, 5) est munie de deux bords de pliage (A), mutuellement opposées, dans lequel chaque bord de pliage (A) est couplé à au moins une surface auxiliaire courbe (10, 11, 12). 15
6. Flanc (1) selon la revendication 1, 2, 3 ou 4, **caractérisé en ce que** la surface principale courbe (3, 5) est munie de deux bords de pliage mutuellement opposés (A), dans lequel chaque bord de pliage (A) est couplé à trois surfaces auxiliaires courbes (10, 11, 12) qui sont placées à une distance mutuelle et qui sont ordonnées en un motif symétrique du type miroir par rapport au milieu de chaque bord de pliage (A). 20
7. Flanc (1) selon la revendication 5 ou 6, **caractérisé en ce que** le flanc (1) comprend six surfaces principales (2, 4, 3, 5, 6, 6'): deux surfaces principales courbes (3, 5), deux surfaces principales plates (2, 4) et deux surfaces d'extrémité principales (6, 6') formant les parois d'extrémité sensiblement plates (18, 21) de la boîte. 25
8. Flanc (1) selon la revendication 7, **caractérisé en ce que** les surfaces d'extrémité principales (6, 6') sont chacune munie de deux bords de découpe incurvés dont la courbure est sensiblement la même que la courbure de la surface principale courbe (3, 5) de la boîte. 30
9. Flanc (1) selon la revendication 7 ou 8, **caractérisé par** deux surfaces d'extrémité auxiliaires (8, 9) ayant sensiblement la même dimension et forme que les surfaces d'extrémité principales (6, 6'). 35
10. Flanc (1) selon l'une quelconque des revendications 1 à 9, **caractérisé en ce qu'une** surface principale courbe (5) est couplée à une surface auxiliaire périphérique (7) le long de sensiblement la longueur totale d'un bord de pliage (B). 40
11. Boîte formée par le flanc (1) selon les revendications 1 à 10. 45
12. Boîte selon la revendication 11, **caractérisée en ce qu'au moins** une surface auxiliaire de pliage (10, 11, 12) est enfermée entre une surface d'extrémité principale (6, 6') et une surface d'extrémité auxiliaire (8, 9 ; 15, 16). 50
13. Boîte selon la revendication 11 ou 12, **caractérisée en ce que** la surface principale courbe (3, 5) est maintenue à une position incurvée par au moins une surface auxiliaire courbe (10, 11, 12). 55
14. Boîte selon au moins une des revendications 11 à 13, **caractérisée en ce qu'au moins** une surface principale courbe (3, 5) est fixée à au moins une surface d'extrémité auxiliaire (8, 9 ; 15, 16).



